PROJECT DESCRIPTION

GENERAL

THIS PROJECT INVOLVES THE RECONSTRUCTION OF THE EXISTING TRAFFIC SIGNAL AT THE INTERSECTION OF MD 2 AT ARNOLD ROAD IN ANNE ARUNDEL COUNTY. MD 2 IS CONSIDERED TO RUN IN A NORTH/SOUTH DIRECTION.

ARNOLD ROAD IS BEING WIDENED ON THE SOUTH SIDE. A NEW CABINET AND MAST ARMS ARE BEING INSTALLED.

INTERSECTION OPERATION

A BASE MOUNTED "S" CABINET WITH UPS SHALL BE INSTALLED AT THIS LOCATION. THE EXISTING CONTROLLER AND LOOP DETECTOR AMPLIFIERS SHALL BE RELOCATED TO THE NEW CABINET. THE INTERSECTION WILL NOW OPERATE IN A FULLY-ACTUATED MODE USING 6 NEMA PHASES. THERE IS AN EXCLUSIVE LEFT TURN PHASE FOR THE NORTH AND SOUTHBOUND MOVEMENTS OF MD 2. THE MD 2 THROUGH MOVEMENTS OPERATE CONCURRENTLY WITH CONCURRENT PEDESTRIAN MOVEMENTS ACROSS THE EAST AND WEST LEGS OF THE INTERSECTION. THE ARNOLD ROAD MOVEMENTS OPERATE IN A SIDESTREET SPLIT PHASE MODE WITH AN ACTUATED PEDESTRIAN MOVEMENT ACROSS THE NORTH LEG OF THE INTERSECTION.

CONTACT LIST

THE CONTACT PERSONS FOR THIS PROJECT ARE AS FOLLOWS:

MS. KIMBERLY TRAN, ASSISTANT DISTRICT ENGINEER – TRAFFIC
PHONE: (410) 841-1019
MR. JAMES FOLDEN, ASSISTANT DISTRICT ENGINEER – CONSTRUCTION
PHONE: (410) 841-1031
MR. JOHN MAYS, ASSISTANT DISTRICT ENGINEER – MAINTENANCE
PHONE: (410) 841-1013
MR. MIKE HUBER, UTILITY ENGINEER
PHONE: (410) 841-1039
MS. CORREN JOHNSON, CHIEF, TRAFFIC OPERATIONS DIVISION
PHONE: (410) 787-7630
MR. EDWARD RODENHIZER, MANAGER, SIGNAL OPERATIONS
PHONE: (410)-787-7652

SPECIAL NOTES

1. ALL INTERNAL CABINET WIRING SHALL BE PERFORMED BY THE SHA SIGNAL SHOP. CONTRACTOR SHALL CONTACT ED RODENHIZER 72 HOURS PRIOR TO CONSTRUCTION.

2. APS WILL FUNCTION AS FOLLOWS:
   FOR MD 2 (RITCHIE HWY)
   A. WHEN PEDESTRIAN LOCATES AND PRESSES PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON MESSAGE WILL BE "WAIT TO CROSS RITCHIE at ARNOLD. WAIT."
   B. WHEN WALK PHASE BEGINS, THE AUDIBLE SOUND WILL BE A RAPID TICK, WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE.

   FOR ARNOLD ROAD
   A. WHEN PEDESTRIAN LOCATES AND PRESSES PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON MESSAGE WILL BE "WAIT TO CROSS ARNOLD at RITCHIE. WAIT."
   B. WHEN WALK PHASE BEGINS, THE AUDIBLE SOUND WILL BE A RAPID TICK, WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE.

GENERAL NOTES

1. VIDEO CAMERA LOCATION/ALIGNING SHALL BE COORDINATED WITH THE SHA ENGINEER.
2. THE CONTRACTOR SHALL VERIFY ALL PROPOSED POLE AND CABINET LOCATIONS PRIOR TO INSTALLATION.
3. PAVEMENT MARKINGS DETAILED ARE PROPOSED AND ARE TO BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH MD-SHA STANDARDS. ALL OTHER PAVEMENT MARKINGS ARE TO BE CONSIDERED AS EXISTING.
4. GEOMETRICS SHALL BE CONFIRMED PRIOR TO THE INSTALLATION OF SIGNAL EQUIPMENT. ALL TRAFFIC SIGNAL FOUNDATIONS SHALL BE INSTALLED AT FINAL SIDEWALK OR CURB GRADE FOR CLOSED SECTIONS, HIGHEST ROADWAY PROFILE GRADE FOR OPEN SECTIONS, TO MEET CLEARANCES AS SPECIFIED IN MD 816.03, MD 818.01, MD 818.02, MD 818.04. THE CONTRACTOR SHALL VERIFY ULTIMATE GRADES PRIOR TO THE INSTALLATION OF ALL SIGNAL EQUIPMENT.
5. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC AND ARE NOT TO BE CONSIDERED COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN THE UTILITIES AND THE TRAFFIC SIGNAL EQUIPMENT WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE PROJECT ENGINEER IMMEDIATELY.
6. PUSHBUTTONS ARE TO BE LOCATED SO THAT THEY CAN BE ACTIVATED BY A PERSON IN A WHEELCHAIR REACHING LESS THAN 18 IN. FROM A 60 IN. x 60 IN. LEVEL LANDING AREA WITH A CROSS SLOPE OF LESS THAN OR EQUAL TO 2%.
7. THE 10 FT. SEPARATION BETWEEN PUSHBUTTONS IS TO BE MEASURED FROM FACE OF PUSHBUTTON TO FACE OF PUSHBUTTON, NOT CENTER TO CENTER OF POLE.
8. PUSHBUTTON ARROWS ARE TO BE PARALLEL TO THE CROSSING FOR WHICH THEY ARE INTENDED.
9. THE LOCATION OF ACCESSIBLE PEDESTRIAN SIGNAL PUSHBUTTONS MUST MEET LOCATION REQUIREMENTS OF MUTCD SEC. 4E.08; 4E.10; FIG 4E-3; FIG 4E-4 AND THE NCHRP PUBLICATION. "ACCESSIBLE PEDESTRIAN SIGNALS: GUIDE TO BEST PRACTICE". IF NOT MET, THE CONTRACTOR IS TO STOP WORK ON PUSHBUTTON LOCATIONS UNTIL A DESIGN WAIVER IS OBTAINED, APPROVED BY THE DIRECTOR, OFFICE OF TRAFFIC AND SAFETY.
10. ALL UNUSED CABLE SHALL BE REMOVED.

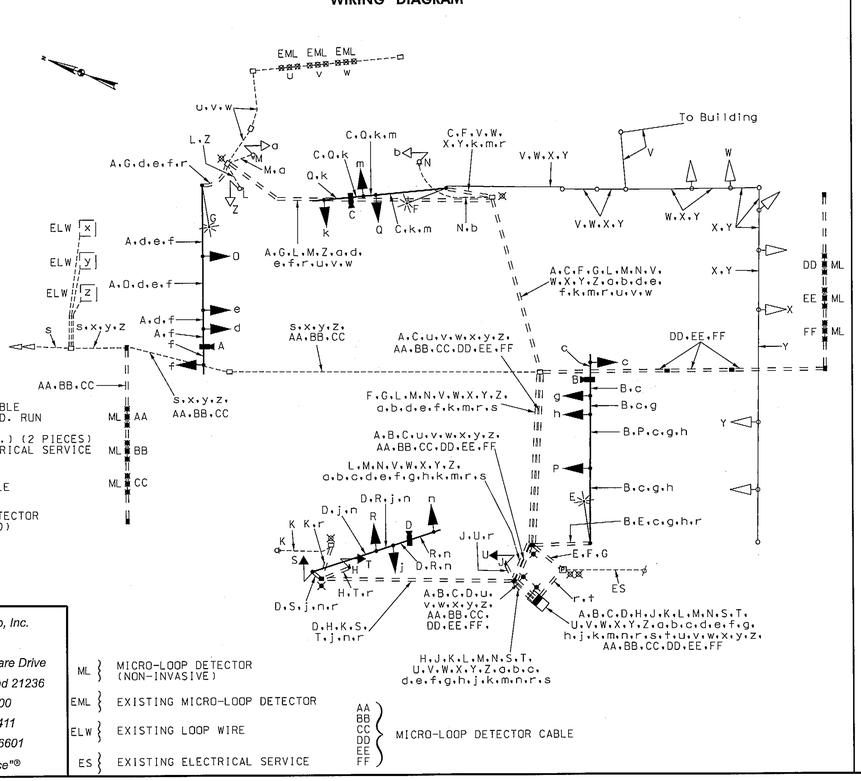
PHASE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15-17	18,19	20,21	22,23	24,25	26,27	
PHASE 1 AND 5	←G–	←G–	R	R	←G–	←G–	R	R	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
1 AND 5 CHANGE TO 1 AND 6, 2 AND 5, OR 2 AND 6																					
PHASE 1 AND 6	←G–	←G–	G	G	←R–	←R–	R	R	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
1 CHANGE	←Y–	←Y–	G	G	←R–	←R–	R	R	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
PHASE 2 AND 5	←R–	←R–	R	R	←G–	←G–	G	G	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
5 CHANGE	←R–	←R–	R	R	←Y–	←Y–	G	G	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
PHASE 2 AND 6	←R–	←R–	G	G	←R–	←R–	G	G	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	WK	WK	DW	
PED CLEARANCE	←R–	←R–	G	G	←R–	←R–	G	G	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	FL/DW	FL/DW	DW	
2 AND 6 CHANGE	←R–	←R–	Y	Y	←R–	←R–	Y	Y	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
PHASE 3	←R–	←R–	R	R	←R–	←R–	R	R	G ←G–	G ←G–	G	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
3 CHANGE	←R–	←R–	R	R	←R–	←R–	R	R	Y	Y	Y	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
PHASE 4	←R–	←R–	R	R	←R–	←R–	R	R	R	R	R	G ←G–	G ←G–	G	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
4 CHANGE	←R–	←R–	R	R	←R–	←R–	R	R	R	R	R	Y	Y	Y	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
PHASE 4 ALT	←R–	←R–	R	R	←R–	←R–	R	R	R	R	R	G ←G–	G ←G–	G	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	WK	
PED CLEARANCE	←R–	←R–	R	R	←R–	←R–	R	R	R	R	R	G	G	G	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	FL/DW	
4 ALT CHANGE	←R–	←R–	R	R	←R–	←R–	R	R	R	R	R	Y	Y	Y	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
FLASHING OPERATION	FL/ ←R–	FL/ ←R–	FL/Y	FL/Y	FL/ ←R–	FL/ ←R–	FL/Y	FL/Y	FL/R	FL/R	FL/R	FL/R	FL/R	FL/R	FL/Y	FL/Y	FL/R	DARK	DARK	DARK	
FIRE HOUSE PRE-EMPTION																					
FIRST CHANGE INTERVAL	←R–	←R–	G	G	←R–	←R–	Y	Y	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	
SECOND CHANGE INTERVAL	←R–	←R–	G	G	←R–	←R–	R	R	R	R	R	R	R	R	Y	Y	R	DW	DW	DW	
PRE-EMPTION PHASE	←G–	←G–	G	G	←R–	←R–	R	R	R	R	R	R	R	R	R	R	FL/ 8" Y	DW	DW	DW	
PRE-EMPTION PHASE CHANGE	←Y–	←Y–	G	G	←R–	←R–	R	R	R	R	R	R	R	R	FL/ 8" Y	FL/ 8" Y	FL/R	DW	DW	DW	

KEY

- A, B, C, D } VIDEO DETECTOR CABLE
- E, F, G } 2-CONDUCTOR TRAY CABLE (NO. 12 A.W.G.)
- H, J, K, L, M, N } 2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
- O, P, Q, R, S, T, U, V, W, X, Y, Z, a, b, c, d } 5-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
- e, f, g, h, j, k, m, n } 7-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
- r } BARE COPPER GROUND WIRE (NO. 6 A.W.G.)
- s } EXISTING INTERCONNECT CABLE W. CAMPUS DR. – ARNOLD RD. RUN
- t } 1-CONDUCTOR (NO. 8 A.W.G.) (2 PIECES) FOR TRAFFIC SIGNAL ELECTRICAL SERVICE
- u, v, w } EXISTING MICRO-LOOP DETECTOR CABLE
- x, y, z } EXISTING SAMPLE-LOOP DETECTOR CABLE (ALUMINUM SHIELDED)
- ⊠ EXISTING GROUNDING ROD
- ⊠ PROPOSED GROUNDING ROD

WIRING DIAGRAM



ML } MICRO-LOOP DETECTOR (NON-INVASIVE)
EML } EXISTING MICRO-LOOP DETECTOR
ELW } EXISTING LOOP WIRE
ES } EXISTING ELECTRICAL SERVICE
AA, BB, CC, DD, EE, FF } MICRO-LOOP DETECTOR CABLE

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"Merging Innovation and Excellence"®

BY: JStorck

EQUIPMENT LIST

A. EQUIPMENT TO BE SUPPLIED BY THE MARYLAND STATE HIGHWAY ADMINISTRATION.

NONE.

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE CONTRACTOR.

QUANTITY	UNITS	DESCRIPTION
LUMP SUM	LS	MAINTENANCE OF TRAFFIC
LUMP SUM	LS	MOBILIZATION
2	EA	10 FT. STEEL PEDESTAL POLE WITH BREAKAWAY BASE
2	EA	27 FT. STEEL MAST ARM POLE WITH 50 FT. MAST ARM
2	EA	27 FT. STEEL MAST ARM POLE WITH 70 FT. MAST ARM
2	EA	15 FT. LUMINAIRE ARM
1	EA	20 FT. LUMINAIRE ARM
3	EA	LED LAMP AND LUMINAIRE
1	EA	BASE MOUNTED NEMA "S" CABINET WITH UNINTERRUPTIBLE POWER SUPPLY, VIDEO DETECTION INTERFACE, TELEMETRY INTERFACE, AND FOUR-CHANNEL LOOP DETECTOR AMPLIFIERS [Note: CABINET SHALL BE PURCHASED FROM ECONOLITE AND DELIVERED TO THE S.H.A. SIGNAL SHOP FOR WIRING AND TESTING. CONTACT MR. ED RODENHIZER (410) 787-7650]
4	EA	VIDEO DETECTOR CAMERA (TERRA)
910	LF	VIDEO DETECTOR CAMERA CABLE
2	EA	AUDIBLE PEDESTRIAN PUSHBUTTON ASSEMBLY WITH PUSHBUTTON SIGN
6	EA	12 IN. 3-SECTION LED SIGNAL HEAD – MAST
4	EA	12 IN. 3-SECTION LED SIGNAL HEAD (RA,YA,GA) – MAST
4	EA	12 IN. 4-SECTION LED SIGNAL HEAD – MAST
1	EA	16 IN. 1-SECTION, 1-WAY LED (COUNTDOWN) PEDESTRIAN SIGNAL HEAD – POLE
2	EA	16 IN.1-SECTION, 1-WAY LED (COUNTDOWN) PEDESTRIAN SIGNAL HEAD – POST TOP
3	EA	30 IN.X 36 IN. R3-5 REGULATORY SIGN – MAST ARM
2	EA	20 IN.X VAR. D-3(1) DUAL FACED SIGN – MAST ARM
2	EA	36 IN. X 72 IN. M1-5(6) SHIELD ASSEMBLY SIGN – POLE MOUNT
2	EA	30 IN.X 42 IN. W9-2(4) WARNING SIGN – MAST ARM
2	EA	24 IN.X 24 IN. M1-5 SIGN – GROUND
1	EA	24 IN.X 12 IN. M3-1 SIGN – GROUND
1	EA	24 IN.X 12 IN. M3-3 SIGN – GROUND
2	EA	21 IN.X 15 IN. M6-1 SIGN – GROUND
34	EA	4 IN. X 4 IN. WOOD SIGN SUPPORTS
6	CY	TEST PIT EXCAVATION
9	EA	HANDHOLE
60	LF	1-CONDUCTOR CABLE (NO. 8 AWG)
630	LF	2-CONDUCTOR TRAY CABLE (NO.12 AWG)
920	LF	2-CONDUCTOR CABLE (NO. 14 AWG)
3700	LF	5-CONDUCTOR CABLE (NO. 14 AWG)
2300	LF	7-CONDUCTOR CABLE (NO. 14 AWG)
525	LF	BARE COPPER GROUND WIRE (NO. 6 AWG)
50	LF	2 IN. PVC CONDUIT [SCHEDULE 80] – TRENCHED
390	LF	3 IN. PVC CONDUIT [SCHEDULE 80] – TRENCHED
210	LF	3 IN. PVC CONDUIT [SCHEDULE 80] – BORED
1	EA	3 IN. WEATHERHEAD
75	LF	4 IN. PVC CONDUIT [SCHEDULE 80] – TRENCHED
305	LF	4 IN. PVC CONDUIT [SCHEDULE 80] – SLOTTED IN ROADWAY
18.65	CY	CONCRETE FOUNDATION FOR TRAFFIC SIGNAL EQUIPMENT
4	EA	GROUND ROD – 3/4 IN. X 10 FT. LENGTH
1	EA	CUT, CLEAN, AND CAP MAST ARM/ POLE
175	LF	12 IN. WHITE THERMOPLASTIC PAVEMENT MARKING – CROSSWALK
70	LF	24 IN. WHITE THERMOPLASTIC PAVEMENT MARKING – STOP LINE
70	LF	3/8 IN. SPAN WIRE
6	EA	NON-INVASIVE MICRO-LOOP PROBE (SET OF 3) WITH 1000 FT. LEAD-IN CABLE
575	LF	RELOCATE EXISTING UNDERGROUND INTERCONNECT CABLE
LUMP SUM	LS	RELOCATE EXISTING TRAFFIC SIGNAL EQUIPMENT FROM EXISTING CABINET (CONTROLLER, APS CONTROL MODULE, AND LOOP DETECTOR AMPLIFIERS)
LUMP SUM	LS	RELOCATE EXISTING TRAFFIC SIGNAL CABLES [3 PROBES AT APPROX. 255 LF; 3 SAMPLE LOOPS AT APPROX. 575 LF]
5	EA	REMOVE AND DISPOSE OF EXISTING CONCRETE FOUNDATION 12 INCHES BELOW GRADE
LUMP SUM	LS	REMOVE EXISTING SIGNAL EQUIPMENT

PROFESSIONAL CERTIFICATION – I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO.: 31757
EXPIRATION DATE: 6/28/2015

STATE OF MARYLAND – FENGXIANG HUANG – NO. 31757 – PROFESSIONAL ENGINEER

MD-AMD Tracking No.:10APAA020

SHA
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 2 (GOVERNOR RITCHIE HWY) AT ARNOLD ROAD WITH ARNOLD VOL. FIRE STATION SIGNAL

ARNOLD, MD

GENERAL INFORMATION PLAN

SCALE N/A DATE AUGUST 29, 2013 CONTRACT NO. BW996M82

DESIGNED BY J. STORCK COUNTY ANNE ARUNDEL
DRAWN BY J. STORCK LOGMILE 0200225.15
CHECKED BY J. DIRNDORFER TIMS NO. M033
F.A.P. NO. N/A TOD NO. N/A

TS NO. 324L-GI | DRAWING SG – 01 OF 01 | SHEET NO. 2 OF 2

PLOTTED: Thursday, August 29, 2013 AT 11:38 AM
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